UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 66515

CSAH NO. 1

OVER THE

CANNON RIVER

DISTRICT 6 - RICE COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 26A)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 66515, Piers 1 and 2 and East and West Abutments, were found to be in good to fair condition with no defects of structural significance observed. Light scaling and cracking was observed for the concrete of the substructure units. The channel bottom appeared to be in stable condition with evidence of minor local scour observed at Pier 2.

INSPECTION FINDINGS:

(A) The concrete was smooth and sound and in good condition with light scaling from the channel bottom to 1.5 feet above the waterline with ¼ inch maximum penetration. There were also random minor cracks on the pier shafts and abutment walls.

(B) A scour depression 5 feet in radius, 2 feet deep was observed at the upstream end of Pier 2 and along the west face.

(C) A light accumulation of timber debris consists of 2 inch diameter and smaller branches were observed at the upstream end of Pier 2. There was also a 1 foot diameter log along the west side of Pier 2.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 66515

Feature Crossed: Cannon River

Feature Carried: CSAH No. 1

Location: District 6 - Rice County

Bridge Description: The bridge consists of three spans of multiple steel stringers supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete hammerhead piers. The piers are numbered from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 23, 2007

Weather Conditions: Sunny, 60°F

Underwater Visibility: 1.0 foot

Waterway Velocity: 2.0 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2 and the East and West Abutments.

General Shape: The piers consist of a reinforced concrete shaft supporting a concrete hammerhead cap. The abutments consist of a reinforced concrete breast wall with skewed concrete wingwalls. No design drawings with appropriate footing details were available.

Maximum Water Depth at Substructure Inspected: Approximately 5.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the north end of Pier 1.

Water Surface: The waterline was approximately 11.0 feet below reference.
Waterline Elevation = 910.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code I/91

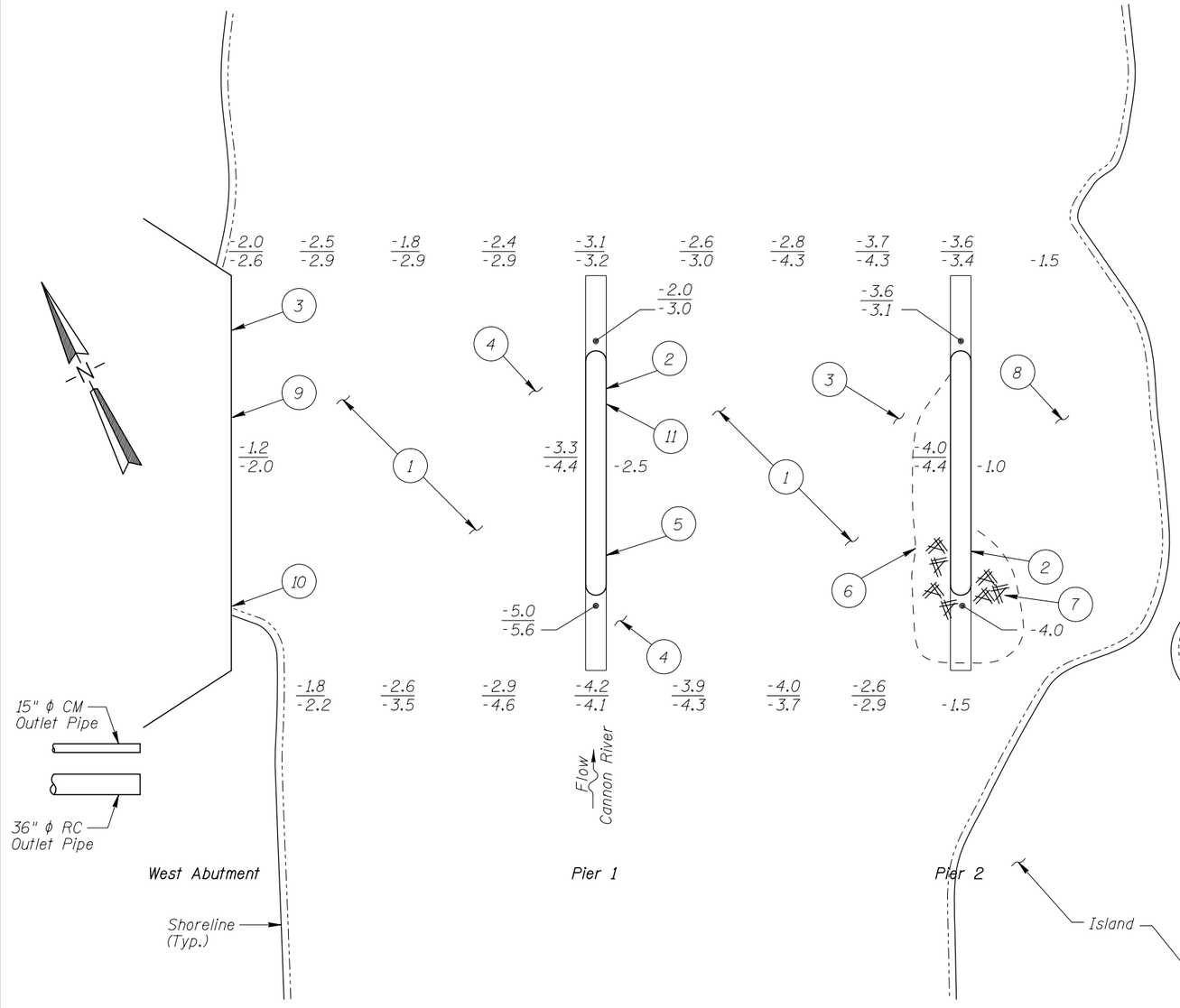
Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____Yes X No

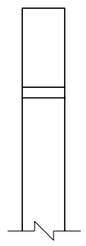
Photograph 1. View of Pier 1, Looking Northeast.

Photograph 2. View of Pier 2, Looking North.

Photograph 3. View of West Abutment, Looking Southwest.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 and the West Abutment were inspected at this bridge.
2. At the time of inspection on October 23, 2007, the waterline was located approximately 11.0 feet below the top of the cap at the north end of Pier 1 of Structure No. 66518. This corresponds to a waterline elevation of 910.5 based on design drawings.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom material consisted of soft silt with 9 inch maximum probe rod penetration.

(2) Light scaling was observed on concrete shaft of both piers, extending from the channel bottom to 1.5 feet above the waterline with a maximum penetration of 1/4 inch.

(3) The channel bottom along the west side of Pier 2 consisted of 5 to 8 inch diameter cobbles with no appreciable probe rod penetration.

(4) The channel bottom material around Pier 1 consisted of course gravel overlaying 18 inch diameter and smaller riprap, with no appreciable probe rod penetration.

(5) A 1/16 inch wide vertical crack with light efflorescence was observed on the east side of Pier 2, extending from the bottom of the pier cap to the channel bottom.

(6) A scour depression 5 feet in radius, 2 feet deep was observed at the upstream end of Pier 2 and along the west side.

(7) A light accumulation of debris consisting of 2 inch diameter and smaller branches was observed at the upstream end of Pier 2. There was also a 1 foot diameter log along the west side of Pier 2.

(8) The channel bottom at Pier 2 (east side) consisted of silty sand with 6 inch maximum probe rod penetration.

(9) A vertical crack 1/32 inch wide was observed around midpoint of West Abutment, extending from 6 feet above the waterline to the channel bottom.

(10) Vertical cracks with efflorescence and moisture, 1/32 inch wide, were observed extending from bridge seat to channel bottom at 8 feet and 16 feet away from upstream corner of West Abutment.

(11) A 1/32 inch wide vertical crack was observed at Pier 1 extending from bottom of pier cap to channel bottom.

Legend

-9.0	Sounding Depth (10/23/07)
-9.0	Sounding Depth (9/27/97)
	Scour Depression

Note:

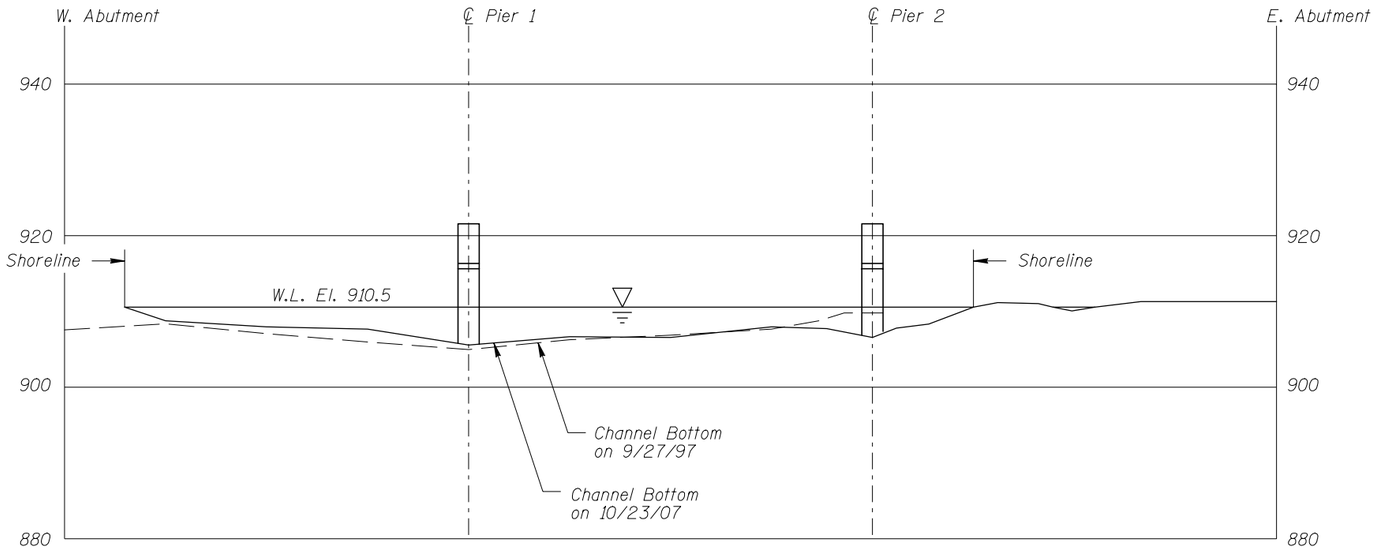
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

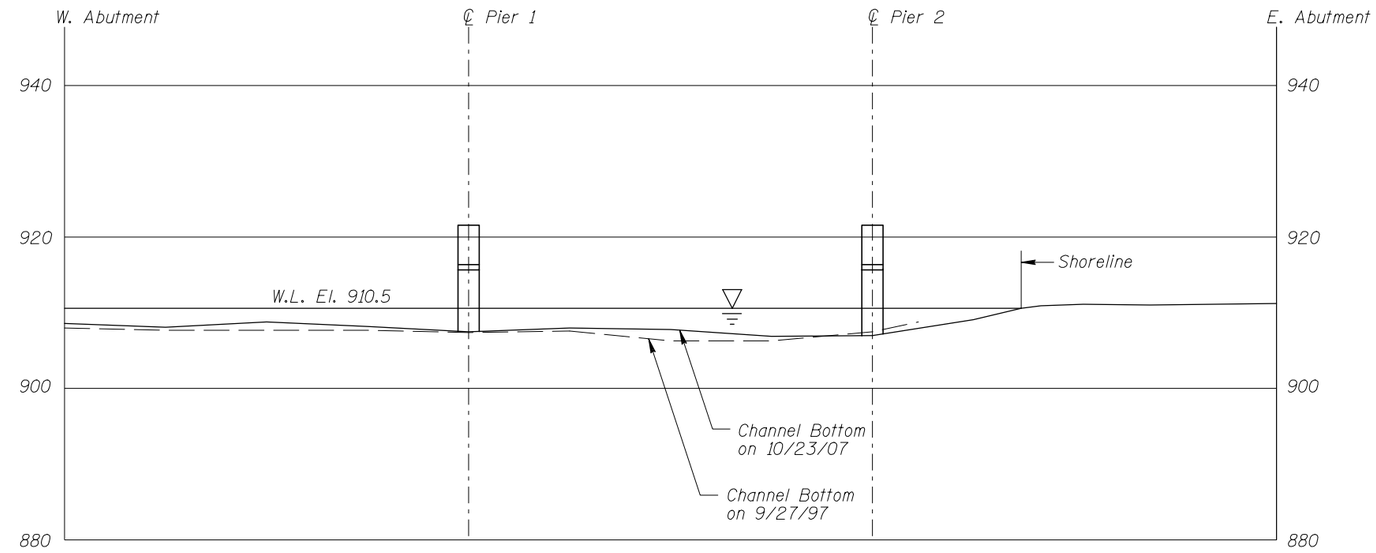
STRUCTURE NO. 66515
OVER THE CANNON RIVER
DISTRICT 6, RICE COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT., 2007
Checked By: BAS		Scale: NTS
Code: 522166515		Figure No.: 1



UPSTREAM FASCIA PROFILE
Vertical Scale: 1"=20'-0"



DOWNSTREAM FASCIA PROFILE
Vertical Scale: 1"=20'-0"

Note:

Refer to Figure 1 for General Notes.

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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT., 2007
Checked By: BAS		Scale: NTS, (U.O.N.)
Code: 522166515		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 23, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 66515 WEATHER: Sunny, 60°F

WATERWAY CROSSED: Cannon River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER_____

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, Sounding Pole, Lead Line, Probe Rod, Camera, Scraper

TIME IN WATER: 2:50 p.m.

TIME OUT OF WATER: 3:20 p.m.

WATERWAY DATA: VELOCITY 2.0 f.p.s

VISIBILITY 1.0 foot

DEPTH 5.0 feet maximum at Pier 1

ELEMENTS INSPECTED: West and East Abutments and Piers 1 and 2

REMARKS: The concrete was smooth and sound and in good condition with light scaling from the channel bottom to 1.5 feet above the waterline with ¼ inch maximum penetration. There were also minor cracks on the pier shafts and abutment walls. A scour depression 5 feet in radius, 2 feet deep was observed at the upstream end of Pier 2 and along the west face. A light accumulation of timber debris consisting of 2 inch diameter and smaller logs and branches was observed at the upstream end of Pier 2. There was also a 1 foot diameter log along the west side of Pier 2.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 66515
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Cannon River

INSPECTION DATE October 23, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	West Abutment	2.0’	N	7	N	9	N	7	8	7	N	N	7	7	N	N	N	N	N
	Pier 1	5.0’	N	7	N	9	N	7	8	N	N	N	8	7	N	N	N	N	N
	Pier 2	4.0’	N	7	N	9	N	7	6	N	N	7	6	7	N	N	N	N	N
	East Abutment	0.6’	N	7	N	9	N	7	7	7	N	N	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

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NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.